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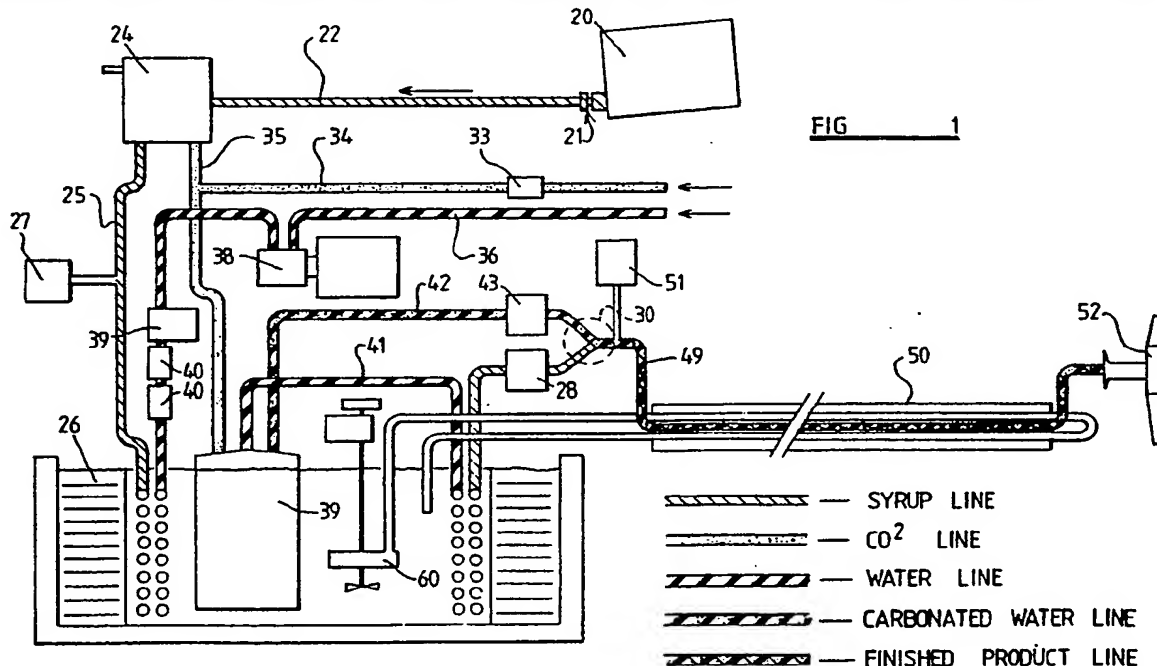
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## (54) Apparatus for dispensing drinks

(57) An apparatus for dispensing drinks, specifically a mixture of syrup (both alcoholic and non-alcoholic) and carbonated water, comprises storage means (20), in which a supply of syrup in a collapsible, flexible bag is located, and a pump (24) to pump syrup via a conduit (25) and cooling unit (26) via a dispensing valve (28) to a mixing zone (30). Located in the conduit (25) is a pressure sensitive switch (27) which is operative, on detection of a reduction in pressure of syrup in the conduit, as occurs when the supply of syrup fails, to terminate operation of the pump (24). Carbon dioxide is fed from a supply to a carbonating cylinder (39), and via conduit (35) to drive the pump (24). Water is fed from a supply through conduit (36) and pump (38), through solenoid valve (39) and cooling unit (26) into the carbonator tank (39).

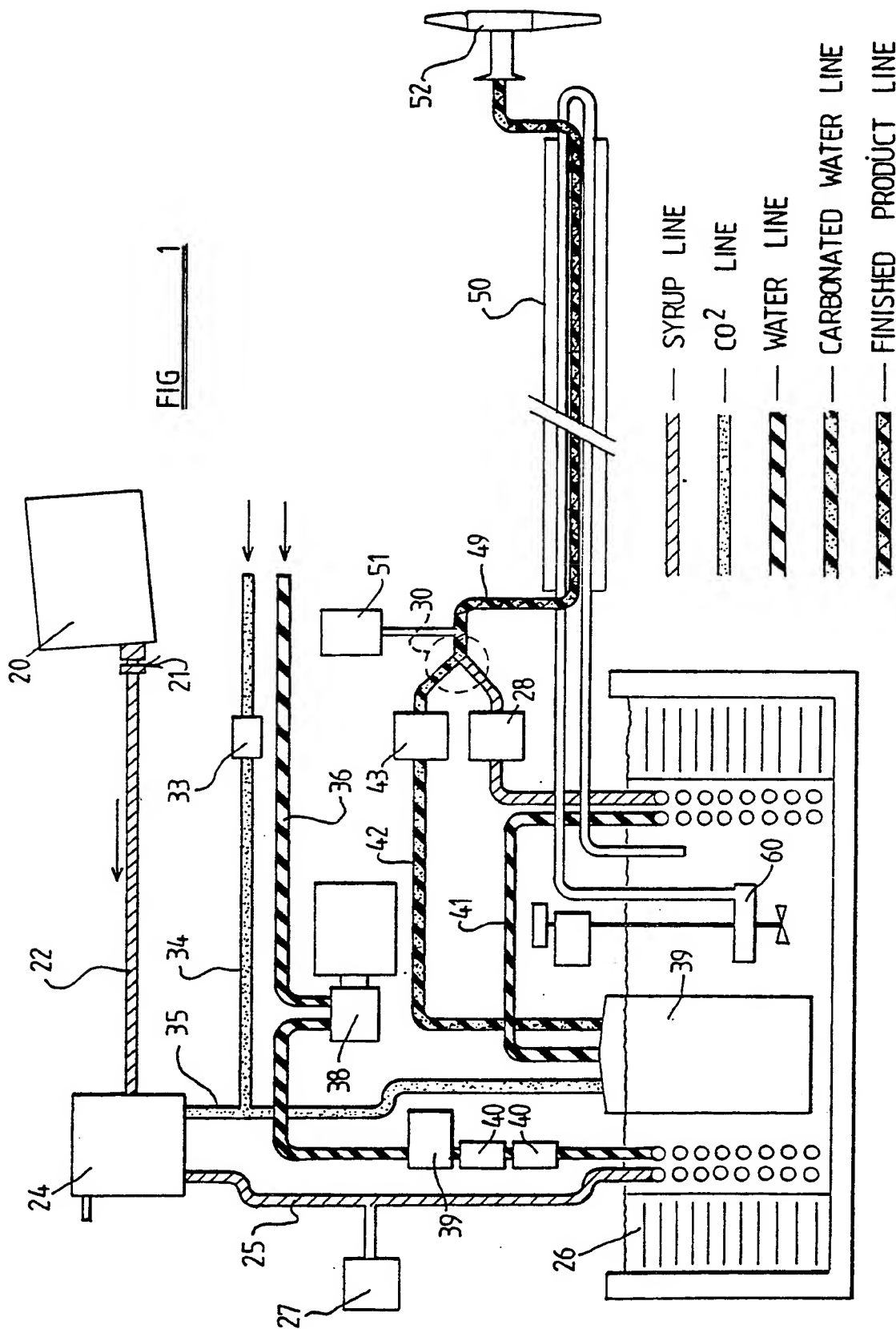
In the depression of a dispensing valve (52), pressure sensitive switch (valve) (51) detects a fall in pressure in conduit (49) and opens the valves (28 and 43), allowing carbonated water and syrup under pressure to flow to the mixing zone (30). On closure of tap (52), the pressure in line (49) increases, and switch (51) causes the valves (28 and 43) to close.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

This print incorporates corrections made under Section 117(1) of the Patents Act 1977.



**Title: "Improvements relating to apparatus for dispensing drinks"**

**Description of Invention**

This invention is concerned with improvements relating to the dispensing of drinks.

More and more frequently drinks are dispensed using apparatus comprising a mixing head, to which separate supplies of drink concentrate [hereinafter referred to as "syrup" for convenience] and carbonated water are delivered, and a dispensing tap from which the liquids may be dispensed directly into a drinking vessel. Such apparatus is commonly used for squashes, colas and other like drinks.

However whilst the output from such apparatus is satisfactory for such light drinks, the appearance and behaviour of the liquids makes it in general unsuitable for use in the dispensing of drinks such as lagers, beers and stouts, including both low or non-acholic varieties.

According to this invention there is provided apparatus for the dispensing of drinks in which syrup and carbonated water are mixed in a mixing zone upstream of a dispensing valve, a pressure sensing means being located in a feed conduit between the mixing zone and the dispensing valve and which is operative, in a reduction in pressure in said line as may be caused when the dispensing valve is open, to cause or allow flow of syrup and carbonated water to the mixing chamber.

Preferably supply conduits for both syrup and carbonated water extend to the mixing zone, flow thereof to said mixing zone being controlled by control valves, said pressure sensing means being operative to open said flow control valves on sensing a reduction in pressure.

By mixing prior to dispensing, and desirably providing a supply of conduit of some significant length between the mixing zone and the dispensing valve - desirably between 0.5 and 3 metres, typically 1 metre - the mixture of syrup, water and carbon dioxide may settle and stabilise to provide a significantly more homogenous brew when dispensed.

Preferably the supply conduit is provided with temperature control means to retain the mixed liquid therein at a desired temperature, to avoid over or under gasification during dispensing.

Preferably the apparatus is adapted to be used with a supply of syrup provided in a collapsible bag, from which syrup is drawn by pump means, said pump means conveniently being driven by pressure of carbon dioxide used in the production of carbonated water,

Desirably pressure sensing means is utilised which is operative to sense the pressure of syrup delivered by said pump means, and which is operative in the sensing a reduction in said pressure commensurate with a termination of the supply, to prevent said flow control valve from opening. Such pressure sensing means may simultaneously be operative to activate an audible or visual warning in relation to the need to replenish the supply of syrup.

Preferably the syrup and the water are fed through temperature control means.

The invention the subject of this application will become more clear from the following description, to be read with reference to the accompanying drawing, of an apparatus which is a preferred embodiment, having been selected of illustrating the invention by way of example.

The accompany drawing is a schematic view of the preferred embodiment.

The apparatus which is the preferred embodiment of the invention is specifically for use in dispensing a mixture of a syrup and carbonated water, for use as a drink. The apparatus has been described particularly for use with syrups of the kind which may be used in the dispensing of lagers, beers and stouts, whether normal strength or low or alcohol-free, although it will be appreciated that the apparatus may be used with advantage in the dispensing of light drinks, such as squashes, colas and the like.

The apparatus comprises storage means 20, in which a supply of syrup in a collapsible, flexible bag may be located, said storage means 20 comprising connection means 21 for connecting the bag to a conduit 22 which extends to a pump 24. Syrup is pumped therefrom via a conduit 25 to a cooling unit 26, and

thence via a dispensing valve 28 to a mixing zone 30. Located in the conduit 25 is a pressure sensitive switch 27 which is operative, on detection of a reduction in pressure in syrup in the conduit 25, as occurs when the supply of syrup fails, and the store 20 needs replenishing, to terminate operation of the pump 24.

Carbon dioxide is fed from a supply [not shown] through a non-return valve 33 via a conduit 34 to a carbonating cylinder 39, a branch conduit 35 extending through the pump 24, so that the pump 24 is driven by carbon dioxide under pressure.

Water is fed from a supply [not shown] along conduit 36 through pump 38, at which the pressure of water is significantly increased, through solenoid valve 39 and a pair of one way valves 40 in series, through the cooling unit 26 and passing via conduit 41 into the carbonator tank 39.

In the tank 39 water is sprayed at high pressure through an atomiser nozzle, where it absorbs carbon dioxide under pressure supplied through conduit 34.

Carbonated water is fed from the tank 39 via conduit 42 to the mixing zone 30 through dispensing valve 43.

Extending downstream from the mixing zone 30 is an outlet or supply conduit 49, which passes through a cooling mechanism 50 to an outlet tap or valve 52. Extending from the conduit 49 is a pressure sensing valve 51. Cooling fluid for the secondary cooling unit 50 is supplied by pump 60 from the primary cooling unit 26.

In the use of the apparatus which is the preferred embodiment of the invention, on depressing and opening the dispensing valve 52, pressure sensitive switch 51 detects a fall in pressure in the conduit 49 and opens the valves 28 and 43, allowing carbonated water under pressure and syrup under pressure to flow to the mixing zone 30, and through conduit 49 to the dispensing valve 52, from which the mixed liquids are dispensed. On closure of the tap 52 the pressure in line 49 increases, and switch 51 causes the valves 28 and 43 to close.

In this manner the syrup is mixed with the carbonated water significantly prior to arriving at the dispensing tap 52, specifically travelling along conduit 49, which is of significant length, being at least 0.5 metres long, and may

if desired by significantly longer. In this manner the quality and constituency of the beverage being dispensed from the tap 52 is significantly improved, and more closely resembles liquid dispensed from a non-post mix system.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in the terms or means for performing the desired function, or a method or process for attaining the disclosed result, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

**CLAIMS:**

1. Apparatus for the dispensing of drinks in which syrup and carbonated water are mixed in a mixing zone upstream of a dispensing valve, a pressure sensing means being located in a feed conduit between the mixing zone and the dispensing valve and which is operative, in a reduction in pressure in said line to cause or allow flow of syrup and carbonated water to the mixing chamber.
2. Apparatus according to Claim 1 wherein supply conduits for both syrup and carbonated water extend to the mixing zone, flow thereof to said mixing zone being controlled by control valves.
3. Apparatus according to Claim 2 wherein said pressure sensing means is operative to open said flow control valves on sensing a reduction in pressure.
4. Apparatus according to any one of the preceding claims wherein a supply conduit between the mixing zone and the dispensing valve between has a length of between 0.5 and 3 metres.
5. Apparatus according to Claim 4 wherein the supply conduit is provided with temperature control means.
6. Apparatus according to any one of the preceding claims, adapted to be used with a supply of syrup provided in a collapsible bag, from which syrup is drawn by pump means.

7. Apparatus according to Claim 6 wherein said pump means is driven by pressure of carbon dioxide used in the production of carbonated water.
8. Apparatus according to any one of the preceding claims wherein said pressure sensing means is operative to sense the pressure of syrup delivered by said pump means, and is operative in sensing a reduction in said pressure commensurate with a termination of the supply, to prevent said flow control valve from opening.
9. Apparatus according to Claim 8 wherein said pressure sensing mean is operative simultaneously to activate an audible or visual signal.
10. Apparatus according to any one of the preceding claims wherein the syrup and the water are fed through temperature control means.
11. Apparatus for the dispensing of drinks, constructed and arranged substantially as hereinbefore with reference to the accompanying drawings.